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INFOCEN DATA BASE MANAGEMENT SYSTEM.(U)
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INFOCEN DATA BASE MANAGEMENT SYSTEM

MEAD TECHNOLOGY LABORATORIES
3481 DAYTON-XENIA ROAD
DAYTON, OHIO 45432

AUGUST 1976

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This technical report has been reviewed and is approved for publication.

ROSS GUBIOTTI, CAPT USAF
PROJECT ENGINEER

FOR THE COMMANDER

ROBERT E DEAL, CHIEF
Electro-Optics & Reconnaissance Branch
Reconnaissance & Weapon Delivery Division

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The major objectives of the planned program of work on this contract are the supplying and maintaining of a Data Base Management System (with its integral Information Storage and Retrieval System); the supplying of technical expertise in various categories to support the DBMS; assistance in transitioning to government leasing of various terminal equipments and the production of certain technical publications and reports; 2nd

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20. (Continued)

outputs of operating system software being tested. This system eliminates
conversion and scaling errors generated in analog instrumentation.

FOREWORD

The work performed under this contract (F33615-75-C-1014)
was authorized by Air Force Avionics Laboratory Project/Task/Work
Unit 2004 05 06, Program Element 62204F, titled Research and
Development Information System. The prime contractor was Mead
Technology Laboratory, 3481 Dayton-Xenia Road, Dayton, Ohio 45432.
During the contract period, July 1, 1974 through September 30,
1975, the Air Force Program Monitor was originally Mr. R. R. Roalef,
(AFAL/TSC). During the period of performance the monitoring or-
ganization was transferred to the ASD Computer Center with the
Project Monitor being Major William Stewart (ASD/ADRP). Submitted
August 1976.

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SECTION I

INTRODUCTION

This is the final Technical Report on Air Force Program
"Information Central" (formerly Avionics Central), contract
number F33615-75-C-1014. The contract period covered July 1, 1974
through September 30, 1975.

The major objectives of the planned program of work on this
contract are:

1. The supplying and maintaining of a Data Base
    Management System (with its integral Information
    Storage and Retrieval System) known as
    (DATA/CENTRAL).

2. The supplying of technical expertise in various cate-
    gories to support the Information Storage and Retrieval
    System.

3. Assistance in transitioning to Government leasing of
    various terminal equipments.

4. Production of technical publications and special reports.

The work was accomplished at three locations: Building 676
(ASD Computer Center) and Building 22 (AF Avionics Laboratory)
Wright-Patterson Air Force Base and at Mead Technology Laboratories.

SECTION II

GENERAL

During the contract period, the Information Storage and
Retrieval System has grown substantially in capability and usage.
The DoD-wide community of Data Base owners are located across the
country as well as at Wright-Patterson Air Force Base.

The identity of this implementation of the (DATA/CENTRAL)
system has changed from Avionics Central to Information Central
(INFOCEN) as responsibility transitioned from the Air Force
Avionics Laboratory to the ASD Computer Center. The computer
hardware used for the implementation is the Government owned and
operated IBM/370 model 155 located in the ASD Computer Center,
Building 676. The personnel supporting this work were located in
Building 676 (ASD Computer Center) and Building 22 (AF Avionics
Laboratory).

The total supporting personnel in categories of Data Base
Administrators, Operating Systems Analysts, Training Specialist,
Data Editors and Data Preparation personnel were a mixture of
Government and contractor personnel. This report covers the
spectrum of contractor supported functions.

SECTION III

COMPUTER CONFIGURATION

The basic computer hardware configuration during the contract
was an IBM 370 model 155 with 3330 type disk facilities. The
computer memory capacity and the variety and quantity of peripheral
devices (disk, tape, printer and communications) grew substantially
during the period.

The initial operating system being used was IBM Disk Operating
System (DOS).

By November 1974 the Operating System was converted to the
full IBM Operating System with Multiple Programming Variable Tasks
(OS/MVT) supported by the Houston Automatic Spooling Program (HASP).
This transition was accomplished by the efforts of the Operating
System Group (Government and contractor staffed). The transition
of INFOCEN to run under these systems was accomplished by the
INFOCEN Data Base Administration Group (Government and contractor
staffed). While the basic (DATA/CENTRAL) system operates in
either the DOS or OS environments, many of the supporting programs
required conversion efforts.

SECTION IV

DATA BASE ADMINISTRATION

Mead Technology Laboratories personnel have been responsible
for the Data Base Administration function for a variety of Data
Bases. Some of these Data Bases were transitioned from other
Government personnel, while some of them were for new customers and
were started from scratch. The new Data Bases entailed the functions
of file design, interface programming, Data Base creation and up-
dating, with emphasis on the first 3 steps. For established Data
Bases the same basic functions were carried out with primary
emphasis on updating and lesser emphasis on file redesign and
new file design to cover new requirements.

The Data Bases being supported during the contract period
are listed below with a general description of the scope of the
individual efforts:

1. The DRONE Data Base assists the ASD DRONE System Project
    Office in managing several elements of their responsi-
    bility. During the period significant file consolidation
    and redesign was accomplished to keep the files in step
    with changes in the characteristics of the available
    input data. Updates were scheduled at weekly intervals.

2.   The AFTEC Data Base was a new application that was
     accomplished for the Air Force Test and Evaluation
     Command headquartered at Kirtland Air Force Base, New
     Mexico. The files facilitate the management of test
     activities and the publication of technical reports.

     This Data Base was designed from scratch with the close
     working relationship established between the Mead
     Technology Laboratories Data Base Administrator and
     representatives of AFTEC.

     By the end of the period the Data Base had grown to
     approximately 6 million characters in size and was
     updated once or twice per month.

3.   The ASPR/POISONS Data Base contains two widely diverse
     information files. The ASPR (Armed Services Procurement
     Regulation) file is of primary interest to the procure-
     ment and contracting community. The POISON (and Antidote)
     File is of prime interest to the medical personnel at the
     Wright-Patterson Air Force Base Hospital.

     The Data Base size is approximately 14 million characters
     and must be updated (or rebuilt) only 2 or 3 times per
     year when a new generation of either of the files is
     available.

4. The NAVY Data Base is supporting two widely separated offices of the U.S. Navy. The primary information content relates to U.S. Naval Regulations (for Chief Naval Operations, Washington, D.C.) and U.S. Navy Training Programs (Pensacola, Florida).

   By the end of the period the Data Base was approximately 25 million characters in size and is scheduled for weekly updates.

5. The AUDGEN Data Base is used as a Management Information tool of the Air Force Audit Agency, headquartered at Norton Air Force Base, California. During the period several new files were established including a Career File, a Messages File and a Resources Utilization File.

   By the end of the period the Data Base size had grown to approximately 60 million characters and weekly updates were scheduled.

6. The DAVA Data Base(s) are a series of new applications for the DoD Directorate of Audio Visual Activities. The original data base design accomplished by the Mead Technology Laboratories personnel encompassed the area of Audiovisual Products and Facilities. Subsequent work, combining the efforts of Mead Technology Laboratories and

Government personnel, expanded the scope to include
Hardware, Inventory and Budgetary information. This
information is currently split between 3 separate
Data Bases.

7.   A Combined Data Base includes two applications for
totally unrelated customers with differing needs.
The FREEDOM OF INFORMATION (FOI) File for Headquarters,
U.S. Air Force, Washington, D.C. and the SOFTWARE LIBRARY
File for Electronic Systems Division, Hanscom Air Force
Base, Massachusetts.

The original file designs and implementations were
accomplished by Mead Technology Laboratories personnel.

SECTION V

TERMINALS AND COMMUNICATIONS

As with other elements of the program there has been a
substantial increase in volume and transition of responsibility
in the area of terminals and communications. At the beginning of
the contract period, the contractor was responsible for providing
virtually all inquiry terminals for the various (DATA/CENTRAL) users.

The government decided to take over the direct lease of the
inquiry terminals. As of the end of the contract period all of the
inquiry terminals which operated at 30 characters per second or
less were transferred to direct government lease. These included
terminals by Texas Instruments, ITT Asciscope, etc. The contractor
continued to supply a number of terminals for other INFOCEN users.
The terminals so supplied included a mix of CCI CC-30 color stations
for 1200 baud transmission and Acoustic Couplers. These equipments
were scheduled for transition early in the next contract period.

SECTION VI

TERMINAL TRAINING COURSE

Mead Technology Laboratories personnel have developed a series of Terminal Training classes. These courses are geared directly to the needs of the Data Base end users. For individuals with little or no data processing experience these courses start out with that assumption and work up from there. For individuals with a data processing background the classes are accelerated. Whenever possible, the End Users are instructed in using the actual data base and files that they will be using in the future.

The courses being taught during this period and the approximate number of students attending were as follows:

1. (DATA/CENTRAL) Computer Terminal Course

   (15 hours) - 130 students

2. INFOCEN Computer Editor Course

   (10 hours) - 60 students

3. Private Files Course

   (10 hours) - 20 students

SECTION VII

DOS & OS CONVERSION

The Operating System used on the originally installed
IBM/370-155 was the IBM Disk Operating System (DOS). The relative
efficiency of DOS had dictated its use in preference to the
additional features (and higher overhead) of the IBM Full Operating
System (OS). As the variety of work requirements for the 370/155
grew the pressure for the added capabilities of OS became over-
whelming. The transition to OS was scheduled to be accomplished
with all possible haste.

The basic (DATA/CENTRAL) system used by INFOCEN is inherently
an OS/DOS compatible system and the transition could be made almost
immediately. In practice, the actual transition date was dependent
on a number of other factors. A significant number of user written
support programs had to be converted from DOS to OS. Prior to that
it was necessary for the various application programmers to learn
the Job Control Language (JCL) necessary for OS operation.

In addition the Operating Systems Group had to create (SYStem
GENerate) an initial OS system; then it was necessary to test and
debug the system; and apply additional Program Temporary Fixes
(PTF's) to yield a viable system.

The actual production transition was accomplished on or about
October 15, 1974.

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SECTION VIII

SOFTWARE IMPROVEMENTS

During the course of accomplishing the contract require-
ments, several significant enhancements were provided in the
(DATA/CENTRAL) System. These enhancements allowed INFOCEN and
all other (DATA/CENTRAL) users to accomplish new or improved
services to their various Data Base customers. The most
significant features are as follows:

1. Real Time Serial File Update. This allows the terminal
user, when using the Text Editor Module to change (Add, Correct
or Delete) the disk copy of the Data Base on a real time basis.
Thus, the next on-line user can immediately view the newly changed
information in the then current form.

2. Improved Diagnostics, including the ability to read from
a control terminal the error messages of the On-Line Subsystem.
Previously these error messages were only directed to the HASP Log
and would be available for viewing only at End of Job time.

3. SUPER-OPEN. Allowing the On-Line Subsystem to overcome
the OS limitation of 255 DD (Data Definition) statements per job.
This had put an unnatural limitation to the number of Data Bases
that could be supported.

4. GETSER. This is a random access of the Serial File
Access Method available to host language programmers in the Input
Subsystem.

5. SORT LIMIT. Sorting (or sequencing) of output is no
longer restricted to the limitations of a core sort. A disk sort
is now available, allowing sort space to be measured in millions
of bytes of disk work area rather than in terms of thousands of
bytes of core work area.

6. Resources - Input (& Output)

A COBOL program is available to effect the input of
accounting records (time cards) from the On-Line and Off-Line Sub-
systems into a Data Base. This, coupled with a specially written
Output Subroutine, allow for the ready evaluation of who is using
the system, how long they are using it, what communications lines
are being used, etc.

7. Monitoring Record. The initial capability is available to
allow a closer monitoring of system usage in terms of what (file
used, searches made, etc.) users are doing. This is a significant
enhancement over the time oriented information available from
accounting records. A COBOL program is available to effect the
input of these monitor records into a Data Base. This provides
the ready manipulation of these records to allow for a new level
of management review of Data Base usage.

8. Batch-Query. Provisions have been made to allow a batch
job to be submitted that will automatically implement the major
features (primarily the search capability) of the On-Line system

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and yield a printed report. Among other potential uses, this tool
will allow the generation of a printed report, similar to what
would be expected from an Off-Line print, without the necessity of
taking On-Line terminal time to spool the output.